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INDUSTRIAL AFFAIRS

No. 507

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METALWORKING EQUIPMENT

YEREVAN GROUP SAYS CHEMICAL INDUSTRY, SCIENCE INTEGRATION NEEDED

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 21 Aug 79 p 2

[Article by N. Ordinyan, staff correspondent, Yerevan: "At the Juncture of Departments"]

[Text] Notes From the Yerevan City Scientific-Practical Conference

When in Yerevan, on the basis of the All-Union Scientific Research Institute of Polymer Products (VNIIpolimer), of its experimental plant, and the chemical combine imeni S.M. Kirov, the Nairit Scientific-Production Association was organized with VNIIpolimer as the head organization, placed before the new scientific-production association were serious problems of development and introduction of new brands of high-quality chloroprene rubbers and latexes, of a new method of producing vinylacetylene, of development of more ideal methods of analytic control of production processes and many others.

These problems did not appear on the day the association was born. They faced the VNIIpolimer institute and the chemical combine earlier as well. Only then they were divided into purely "scientific" and "production" problems, and this contributed little to the introduction of the new developments of VNIIpolimer and other institutes into practice. And, what is no less important, many tasks directly connected with production proved to be outside the sphere of influence of the researchers.

Under the conditions of the association this separateness disappeared. During planning of the activity of the scientific and production association the interests of its structural subdivisions are considered as a whole, and a determination is made of the priority tasks which raise sharply the effectiveness of the scientific developments.

The associations of laboratory No. 32 in the institute developed, for instance, a new high-quality latex, L-18. As soon as several test batches of the new latex appeared at the experimental plant and received a positive conclusion from the specialists and consumers, literally then, in a month, the chemical combine began the output of L-18 under industrial conditions.

Being solved at the same rates in the association are "purely production" problems. For many years the combine produced rubber according to a clearly out-dated technology. It required a total of five months of work of the collectives of laboratory No. 31 of the institute and the rubber production facility for the creation of a new method of producing this product.

The problems of increasing the effectiveness of production and improving the quality of output produced are included in the plans of scientific research of the institute, and its laboratories are becoming scientific curators of the output of series production, they are helping to bring the quality of the products up to the best world indicators.

The work experience of the Nairit scientific-production association attracts attention because the main task of our time--and this was stressed by all the comrades who spoke at the conference--is the fastest possible introduction into production of scientific achievements, technical innovations, progressive technological processes, raw material and supplies. And the most effective form of organization insuring successful solution of these tasks is namely the association. Here the scientific searches, the planning and design development and their introduction form a single, melded process, thanks to which the times for assimilation of new things are reduced several-fold.

However, despite the clear advantages of the associations, many union ministries and departments are not creating them actively enough. And even the leaders of enterprises and institutes far fromalways approach this problem from the state point of view. Let us turn to the facts.

Operating today in the republic are 73 production associations. However, among them are only four scientific-production associations. Even this figure by itself tells a great deal.

Not easily formed are the relations between science and practice in production associations in the make-up of which there are large sector scientific-research institutes. On the one hand the creation of such associations has helped to accustom researchers to solution of the most important tasks of production. In the VNIIKE [expansion unknown], which is part of the Armelektromash Production Association, 60 percent of the jobs are done for its own plant. On the other hand, in production associations, in distinction to scientific-production associations, the industrial enterprises do not bear responsibility for the work of the institutes, for fulfillment of their plans. The leaders here are interested first of all in product output. There is one more factor: when developing new products, the collectives of the scientific research isstitutes strive to execute them on the level of the best domestic and foreign models. Meanwhile the plant people, as a rule, demand bringing the innovations close to the technical and technological possibilities of their own enterprises.

As a result a situation can take shape in which the labor collectives, providing for today, begin to forget about tomorrow, about the future of their own sector. Such a danger is completely excluded in a scientific-production association.

At the conference much attention was given to problems of rational utilization of scientific and technical potential.

In the Academy of Sciences of Armenia, dozens of scientific-research institutes, branches of institutes, special design bureaus of associations and enterprises, and vuzes, about 30,000 people are engaged in scientific research and the development of new equipment and technology. But these geat forces are still being used unsatisfactorily. Let us turn to the facts.

Out of all the experimental design and technological developments carried out during the last five years by scientific research institutions of Yerevan, only 34 percent were introduced into production. The fact is that the republic agencies do not have sufficient information about the work of scientific institutions, union ministries and departments. The isolation of research collectives, living, as it is called, in a neighborhood, in one republic, brings great detriment to the cause. They cannot work out a unified scientific-technical platform taking into account the interests of development of the economy of the region. As a result their potentials are not fully utilized, and many associations and enterprises, proceeding from narrow departmental interests, are striving to have even a low-capacity, but their own scientific base.

Approximately such a situation took shape in the chemical industry of Armenia. Here there are seven scientific institutions of the Ministry of the Chemical Industry. Among them are two institutes, five departments, the head institutes of which are located outside the republic. They do not have true interaction, clear distribution of tasks and duties. As a result they have little influence on the industrial output of the plants, also subordinate to the Ministry of the Chemical Industry. Approximately 65 percent of this output does not have scientific backing in the republic.

It is advisable and economically profitable to think about more flexible planning and coordination of the work of institutes which are in one republic. This will speed up the solution of tasks provided by the resolution of the CPSU Central Committee and the USSR Council of Ministers, "On Improvement of Planning and Increasing the Action of the Economic Mechanism on Increasing the Effectiveness of Production and the Quality of Work."

In the recommendations made by the conference practical measures are outlined for solution of many urgent problems of integration of science and production, of acceleration of the rates of scientific and technical progress. A large place in them is set aside for dissemination of the advanced know-how accumulated in L'vovskaya Oblast in creation of intersector scientific-production associations and complexes for solution of the major national economic problems.

10908
CSO: 1821

BELORUSKALIY PLANT CONSTRUCTION STATUS REPORTED

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 14 Aug 79 p 3

[Article by V. Protasenya, Soligorsk, Belorussian SSR: "Subcontractor, Keep Up the Tempo!"]

[Text] The Beloruskaliy Production Association imeni 50-letiya SSSR annually supplies to the country over 9 million tons of potassium fertilizers. Last year the flow of them from Soligorsk was increased by 1,700,000 tons--this is the productivity of the new capacity of the fourth Soligorsk potassium combine which was put into operation. This year the course of the flow will be widened still more. The builders and assemblers are preparing to turn over the second phase of the plant in December.

Very little time remains before the introduction. Therefore the general contractor, trust No. 3 of the Ministry of Industrial Construction of the Belorussian SSR, is doing everything possible to speed up the operations. It is supported by the collectives of subcontractors also. Such as, for instance, the brigade of L. Volkov from the Soligorsk installation administration of the Minsktekhmontazh Trust. It is one of the active participants in the "worker's relay." In-house quotas for assembly of structural parts are fulfilled considerably in advance of the flow-chart, giving the neighbors a reserve of time. There are many such examples. The competition yields the opportunity to perform the construction at rates close to the planned ones. In seven months the assignment for construction and installation operations was overfulfilled by 700,000 rubles, which all together makes up 53 percent of the annual volume.

But if we remove ourselves from the figures and look at the actual state of affairs for a number of projects, relates the secretary of the party committee of the main contracting trust, I. Ladut'ko, the picture does not appear so satisfactory. Stumbling blocks are placed in front of the finish line for the participants of the competition by the client, their own ministries, the republic supply agencies, and by "distant" suppliers.

The main contractor, for instance, today is not fully clear regarding the underway complex. And this is not the only complaint against the chief partner in the competition--the client. The construction project needs 1,440 tons of so-called non-standardized equipment, but during seven months only 875 tons of it has arrived. For this reason it is impossible to put together and install the existing basic technological assemblies. Back in June the client should have been supplied with three units of large-dimension imported equipment. Only two came. But even the installation of these was not begun due to the absence of a representative of the chief installer. The time of arrival of the third unit is not known at all.

The participants in the competition are poorly assisted by their ministries also. By joint measures of the republic Ministry of Industrial Construction and the Ministry of Installation and Special Construction Work for insuring the introduction of capacities it was envisaged to complete the supply of the projects with wall panels in August. However repeated appeals of the main contractor to the planning and production administration of the Belorussian SSR with a request to allot the limits for the third quarter have remained unsuccessful. And without the enclosing structural parts the supplier-firm will not authorize the start of installation of the imported equipment. Today the Soligorsk builders have serious complaints also against the suppliers which even with respect to the allocated funds supply cement with great irregularity.

The builders hope that the subcontractors will catch their concern and use their efforts so that one of the most important factories of fertility will produce output precisely at the planned time.

10908
CSO: 1821

UPDATE ON BELORUSSIAN ECONOMIC EXPERIMENT

Moscow PROMYSHLENNOYE STROITEL'STVO in Russian No 6 Jun 79 pp 5-9

[Article by N. T. Arkhipets, Belorussian SSR Minister of Industrial Construction: "The Belorussian Economic Experiment - Possibilities and Results"]

[Text] "Management work and primarily planning work must be aimed at final economic results."

(From the report of the CPSU Central Committee to the 25th Party Congress)

"To improve methods of economic management and economic stimulation, the system of criteria for evaluating the work of associations, enterprises and organizations, based upon the need to improve the final results of production. To strengthen the role of economic stimuli in the growth of production efficiency, the raising of product quality, the speeding up of scientific-technical progress, the providing of a rhythmic functioning of enterprises, the improving of the utilization of labor and material resources."

(From the Basic Trends for the Development of the USSR National Economy in 1976 through 1980)

From the editors: When we assembled a collection of articles on the Belorussian experiment in issue No 7, 1977, of PROMYSHLENNOYE STROITEL'STVO, we told our readers that we would return to this vital topic at a later time.

In the following article by the Belorussian SSR Minister of Industrial Construction, N. T. Arkhipets, "The Belorussian Economic Experiment -Possibilities and Results", the outcome of more than three years of work by the ministry under new conditions is evaluated and the instances of negligence that ocurred are noted, including those for which the builders were not responsible; and questions are asked upon the answers to which depends the successful conclusion of the experiment.

In implementing the decisions of the 25th CPSU Congress and the instructions, advice and critical comments expressed by L. I. Brezhnev during his visit to Minsk, the builders of Belorussia have done their utmost in 1978 to fulfill their plans and the socialist pledges that they made.

Brezhnev's high evaluation of Belorussia's contribution to the all-union national economic complex has been an unprecedented labor and political morale boost, has promoted the search for and the use of existing resources and a rise in the effectiveness of capital investments.

In accordance with a commission from the USSR Council of Ministers the Belorussian SSR Ministry of Industrial Construction is conducting an experiment on further improving the planning system and financial management mechanism in construction. The essence of the experiment is: to apply economic methods of management, to devise and develop new forms of economic management and to solve several new tasks for improving capital construction based upon the experience that was gained during the Ninth Five-Year Plan.

The goal of the experiment is to confirm the feasibility and effectiveness of orientating construction workers toward final national economic results - putting construction projects and capacities into operation, promoting the prevention of capital investment overextension and reducing construction time periods.

In the organizational-technological plan the experiment calls for the creation of a long-term technological production flow based on two-year and five-year plans and correspondingly the more complete use of the construction organizations' available capacities.

In the economic plan the experiment calls for the development of a system of complete self recovery, a system of estimates for completed projects and complexes, for the adoption of principles for extending credit for unfinished production and the establishment of new interrelations with the budget (payments are made based on planned tasks rather than on actual fulfillment). The economic and financial indicators of the construction organization's work are made directly dependent upon the implementation of construction projects, while profit serves as the chief source for covering production outlays and for its development and stimulation.

The Belorussian SSR Ministry of Industrial Construction has been given the job of reducing by the end of the Tenth Five-Year Plan the time periods for the duration of construction by 25 percent as opposed to what transpired in 1975, of bringing uncompleted construction production up to the standard, having freed 300 to 400 million rubles in capital investments and no less than 5 percent of material resources (the amount the ministry is short each year) from circulation in estimate for the ministry's program.

To achieve such results and to realize the self recovery principle it is necessary to ensure a profitability of no less than 10 percent, an average annual growth in work volumes of 6 to 7 percent and a growth in labor productivity of 5 to 6 percent.

The extensive use of leading experience and available reserves of construction production are required to ensure this level of technological and economic indicators.

Favorable conditions were not created for the ministry to conduct this rather important experiment. What is more, the ministry was given very taut assignments for the Tenth Five-Year Plan: the assimilation of fixed capital was increased 1.7-fold over the Ninth Five-Year Plan; the estimated amount [of fixed capital] was increased by 43 percent; and the percentage of finished product in the total construction and installation work was increased by 90 percent. The most important projects of all branches of the national economy were included in the program: mineral fertilizers, special branches, machine building, agricultural production and special order.

	Ninth Five-Year Plan (actual fulfillment)	Tenth Five-Year Plan (planned fulfillment)	Growth (percentage)
Amount of construction and installation work, in millions of rubles....	3,897	5,574.6	143
Output at the end of the five-year plan, in millions of rubles.....	9,097	11,735	129

The Belorussian SSR Ministry of Industrial Construction has now been working for three years in the conditions of the experiment. It is time to ask: what have the results been?

The ministry has put more than 1,600 construction projects into operation during the years 1976 through 1978.

The assimilation of construction projects for the national economic plan, which were planned for the first three years of the five-year plan, has been ensured for the total amount (with some deviation from the approved product list). Of 276 capacities originally planned for the entire five-year plan, 191 have been put into operation.

More than 200 construction projects and production capacities have been put into operation ahead of schedule and in excess of the established plan. They include 2,500 textile spindles, 400,000 tons of mineral fertilizers (200 tons over the plan), 909 looms (700 over the plan), 31,000 tons of elevator storage capacities, a 1.12 million capacity poultry plant (600,000 over the plan) and livestock facilities for 6,350 head (750 head over the plan).

A crusher-sorting plant in Mikashevichi, the Orsha silica brick plant, the Mogilev silk fibers combine, the Gomel' shoe factory, the "Integral" P.T.O. /production technical association/ in Minsk and others have been put into operation well ahead of schedule.

The three-year assignment, called for by the five-year plan, to put 6.4 million square meters of living space, space for 86,800 students in schools and space for 6,100 out-patients in polyclinics was fulfilled. Assimilated were 58.5 percent of the planned childrens' institutions, 59 percent of the schools and 64.5 percent of the hospitals. Sold were 2,550 million rubles worth of commodity construction products. The average annual growth rate rose by more than 10 percent; the growth rates of commodity construction products exceeded the growth of the amounts of construction and installation work.

The amount of construction and installation work fulfilled in 1976 through 1978 amounted to 2,745 million rubles. A growth by 24.5 percent as compared with the three years of the Ninth Five-Year Plan was provided. During the three years of the Tenth Five-Year Plan the time periods for the duration of construction work were reduced by 14 percent, while the amount of unfinished construction work was brought to the standard, which shows that the turnover rate of capital investments was speeded up.

In the Tenth Five-Year Plan approximately 200 planned measures for new technology were adopted each year. Within the three years 31,690 proposals for improving production methods and 232 Soviet inventions were adopted, 73 million rubles were saved and 8,859 workers were conditionally freed from manual labor. Manual labor was reduced by 7.29 percent against a planned figure of 6.2 percent.

Of the total construction and installation work in 1978 the percentage of fully prefabricated construction amounted to 74.5 percent as opposed to 63.7 percent at the end of 1975.

At the same time the Belorussian S. S. Ministry of Industrial Construction was unable to fulfill all of the indicators planned for the three years of the five-year plan.

The annual plans for commodity construction products were underfulfilled by more than 100 million rubles and the assignments for the amount of construction and installation work were underfulfilled by 240 million rubles.

The established lists of construction projects of the national economic plan to be put into operation and growth in labor productivity were not met. What were the reasons?

First, the ministry's construction organizations did not make full use of available capabilities.

Shortcomings in the organization of labor, in management and other reasons, which depend upon the builders themselves, account for the underfulfillment of up to 40 percent of the plans for the assimilation of construction

projects as well as the construction and installation jobs.

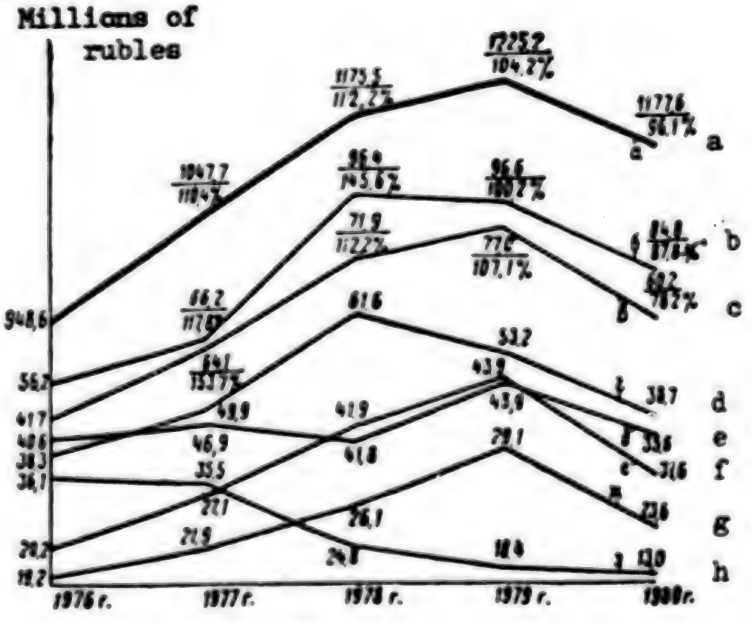
Second, the previously planned re-organization in planning, preparing for construction and material-technical support was not carried out; nor was the comprehensive approach to solving the ministry's problems taken.

Even in an experimental system the ministry was unable to obtain a five-year plan or even a two-year plan that was balanced for all indicators; this was a serious hindrance factor in realizing the experiment and in general all work in raising the efficiency of construction work.

General, yearly changing five-year plan indicators do not make it possible for the construction organizations to formulate plans that are stable for all technical-economic indicators.

It is apparent that when the duration of construction work exceeds one calendar year the annual plan is not compatible with the nature of construction work. As a minimum a two-year plan is needed or, even better, a five-year plan.

The five-year plan was not balanced with the capacities of the construction organizations (drawing 1). With the total growth in the amounts of construction and installation work for an amount greater than 40 percent that was planned for the ministry in the five-year plan, there was uneven growth of the amounts for each of the years. There was a lack of balance in the annual plans as well.

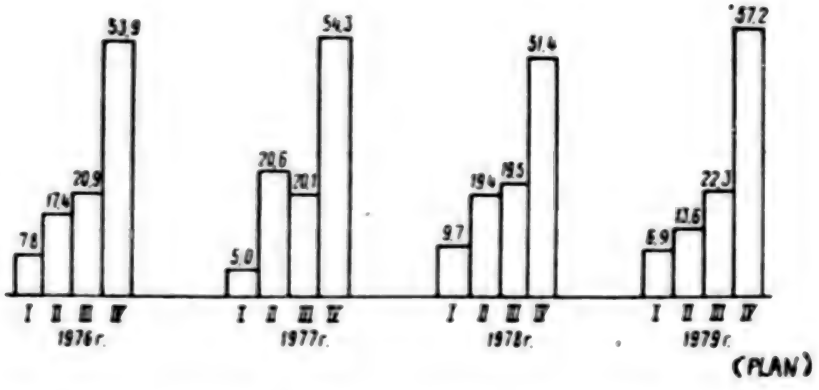


Drawing 1: Distribution of amounts of construction and installation work (in millions of rubles) for each year of the Tenth Five-Year Plan
a - Belorussian SSR Ministry of Industrial Construction on the whole; b - Gomel' Industrial Construction Trust; c - Grodno Industrial Construction Trust; d - Trust No 21; e - Trust No 12; f - Trust no 20; g—Trust No 23; h - Trust No 13

Because some of the ministry's construction trusts are overburdened, the fulfillment of 30 million rubles worth of construction and installation work is threatened with disruption.

At the same time in connection with a decrease of the program in other areas capacities are not being used, which provide for fulfilling the program by 40 million rubles

Due to the lack of stable five-year and two-year plans we were unable in the three years to substantially influence the equalization of assimilations for each of the quarters; as before in the plans more than half of the commodity product comes in the fourth quarter with an under loading of capacities in the first six months, particularly in the first quarter (Drawing 2).



Drawing 2: Distribution of commodity construction product by quarters for the period 1976 through 1979.

The ministry has tried to even out the load through the use of departmental planning and other measures. Thus, in three years it has managed to hasten the assimilation of more than 200 various kinds of construction projects, having handed over several projects ahead of schedule (for the ahead-of-schedule assimilation the builders receive 50 percent of the profit realized from the industrial product obtained during the time that the project was operating ahead of schedule). However, these measures have not been sufficient to organize the technological flow and to equalize the assimilation of construction projects throughout the quarters.

One of the reasons for the unequal loading of construction organizations in the course of a year is the inefficient delivery of equipment, which causes the construction and installation organizations to incur large losses in labor productivity and the under utilization of capacities.

Unfortunately, there are also cases when it is known ahead of time that a project under construction will not be outfitted with equipment; at the same time the assimilation of capacities is written into the plan.

For example, the Mozyr' NPZ [oil refinery], which was to have been assimilated in 1977, was outfitted with equipment in 1978 with great difficulty. In connection with this the construction trust lost 200,000 rubles in profit, paid increased interest on loans amounting to 300,000 rubles, permitted an overexpenditure from the wage fund amounting to 300,000 rubles and lost 17,000 rubles from the economic stimulation fund. Unfortunately, these are not isolated examples. What caused this?

First of all by the fact that under the existing system equipment is allocated, as a rule, in planning for the current year. For this reason the customers seek at any cost to plan the assimilation of a construction project, even when they know it is unrealistic to do so, so that they can procure equipment ahead of time. In our opinion the use of a plan as an instrument for equipping construction projects cannot be tolerated.

The lack of effective two-year planning is a second reason.

In the course of the experiment the responsibility of the contractor for the timely assimilation of capacities has grown beyond measure. If the assimilation is disrupted the builders because of the credit system are automatically subject to economic sanctions, which are rather serious.

In connection with the underfulfillment of the plan for the three years for commodity construction product and the total amount of work due to the disruption of time periods for the delivery of equipment and materials alone, the organizations of the ministry lost 23 million rubles in profit, paid increased interest on loans amounting to 11 million rubles and lost more than 2 million rubles from the material stimulation funds. At the same time the customers and other participants in capital construction - who were often the chief culprits for the disruptions that occurred - bore no economic responsibility.

The Belorussian Ministry of Industrial Construction has taken several measures in regard to one of the basic directions for raising the efficiency of capital construction - improving the system of material-technical support and the outfitting of projects.

In accordance with Decree No. 389 of 28 May 1969 of the CPSU Central Committee and the USSR Council of Ministers, in 1975 the ministry's organizations were transferred to material supply through the organs of the USSR Gossnab [State Committee for Material-Technical Supply].

The specialized trust Stroykomplekt [construction and outfitting], which was created in 1973, manages its outfitting at the ministry level. Their requirement for material-technical resources is planned for them, metal constructions are assembled for them as are manufactured articles made of wood and gas silicates, local materials, all kinds of equipment and cable products for construction projects of their own construction; and also the outfitting of projects with materials from the product list of the Belorussian Gossnab is coordinated.

Each year the trust outfits 4,700 to 5,500 projects with constructions, parts and materials; these projects are fully supplied with 118,000 to 125,000 tons of metal constructions, 1,500,000 to 1,700,000 square meters of window and door units and also nearly 6,000 designations of materials, manufactured articles and equipment from 480 enterprises and organizations.

In the construction organizations and at the ministry's enterprises purposeful work is under way to lower the consumption of materials, to conserve rolled metal, cement and other construction materials. To comprehensively solve the problem of conserving materials a target program for conserving material resources has been created and is functioning; the program calls for organizational and engineering and technical measures to be taken which provide for the fulfillment of assignments for conserving materials which were established for the ministry for 1976 through 1980.

The accomplishment of these measures within the three years of the Tenth Five-Year Plan has provided a savings of 12,800 tons of metal (Steel grade 3), 78,100 tons of cement (M 400), 77,000 cubic meters of timber (in round figures), 152,100 square meters of glass and 23,700 tons of petrobitumen.

However, the ministry's nearly three years of experience in providing construction trusts and combines with materials through the Belorussian SSR Main Administration for Material-Technical Supply have also pointed out some significant shortcomings in the organization and accomplishment of supply.

The basic provision of Decree No. 389 of 28 May 1969 of the CPSU Central Committee and the USSR Council of Ministers concerning the supplying of construction projects with material resources in accordance with their need, which is determined by the plans and estimates, is not being executed. The allocated resources of basic materials are not meeting the requirements, which are determined by the plans and estimates for the physical amounts of work.

The difference between the allocated rolled metal and the actual requirement of the ministry is cited below in thousands of tons (Steel grade 3):

Years	Difference when transferring to physical volumes of work	Additional allocations	Actually delivered	Underallocated
1976	25	25	15.6	9.4
1977	38.2	21	7.2	31
1978	34	-	7	28
Total	97.2	46	29.8	68.4

However, the most important thing is that the allocated resources be delivered in time and in the necessary product list.

Significant losses occur due to the fact that the required profiles of rolled metal are not delivered; this has led to profiles that are more material intensive being substituted.

In addition there have been significant losses of metal due to the transfer to the USSR Ministry of Installation and Special Construction Work of limits for low-alloy steels for manufacturing metal constructions, which are inflated in comparison with working diagrams.

The losses in thousands of tons (Steel grade 3) which were incurred for these reasons during the three years are cited below:

Years	Inflation of limits for low-alloy steel transferred to the USSR Ministry of Installation and Special Construction work	Substitution of rolled metal and under delivery of effective kinds of steel	Total shortage of metal
1976	-	6.26	6.26
1977	11.2	8.97	20.17
1978	6.7	8.7	15.14
Total	17.9	23.93	41.57

The losses of amounts of construction and installation work due to the incompleteness of just metal supplies amounted to:

Years	Shortage of rolled metal for the planned volumes of work, in thousands of tons	Above norm remainders at end of year, in thousands of tons	Norm of expenditure per one million rubles worth of construction and installation work (planned) in tons	Losses in volume of construction and installation work, in millions of rubles
1976	7.23	6.37	363.7	2.36
1977	23.85	7.17	376	44.36
1978	21.54	8.12	366.9	36.3
Total	52.62			83.02

It must be pointed out that even the total drawing into production of transferable above-norm remainders would make it possible to only partially decrease the losses of capacity of the construction organizations because of the inadequate supplying of metal for the planned volumes of work. Even the norms of production reserves of basic materials are insufficient because they do not conform to the conditions of the quarterly delivery of resources.

Under the existing conditions for delivering rolled metal, which lead to violations of time periods, irregularity and hold-ups in assortment and profiles, especially small and medium sizes, and profiles of reinforcing steel, the norm of production reserves of metal of 29 days, which was established for the Belorussian SSR Ministry of Industrial Construction over a period of several years, is inadequate. According to the ministry's estimates, if one uses realistic delivery conditions, the norm should be increased to 40 days.

A similar condition has evolved for the delivery of other kinds of basic resources as well. For example, the annual difference between the requirement and what is actually allocated amounts to as much as 10 percent for timber materials and from 3 to 5 percent for cement.

Considering all of the shortcomings in material-technical support, the lowering of the capacities of the construction organizations and industrial enterprises, the underfulfillment of construction and installation work on the whole for the ministry amounted in 1976 to 16 million rubles, in 1977 to 40 million rubles and in 1978 to 38 million rubles.

What kind of conclusions can one reach on the basis of the three-year experience of operating in the experiment?

First, the activity of the economic mechanism prompts the construction organizations to seek reserves and possibilities for fulfilling established plans. The growth of commodity construction product, the lowering of the time periods for the construction of projects and the reduction of unfinished contruction, etc., attest to this.

Along with this the experiment has quite clearly shown that if the basic economic requirement - to improve the planning of construction work - is not fulfilled, if unrealistic and unbalanced in all indicators plans are established for the ministry, then the economic methods do not function effectively.

In these conditions it is impossible to successfully solve questions on the organization of continuous planning, the technological flow - the initial position for the extensive adoption of leading methods of labor, modern technology and the steady fulfillment of plans for growth in labor productivity. Besides this, the organization of universal effective socialist competition is made difficult.

It should be pointed out that the USSR Gosplan, the USSR State Committee for Construction Affairs, the USSR Gossnab, the USSR Ministry of Finance and the USSR Stroybank [construction bank] have actively helped the ministry at all stages of conducting the experiment, but, unfortunately, many questions remain unresolved to the present day.

Thus, in 1976 through 1978 the Belorussian SSR Ministry of Industrial Construction, which had seen its specific responsibility increased beyond measure, was forced to operate in former or even somewhat worse conditions.

The Belorussian SSR Ministry of Industrial Construction more than once asked questions and made proposals to the USSR Ministry of Industrial Construction, the USSR Gosplan, the USSR Gossnab and other directive organs. And now, when there is less than one and a half years until the end of the Tenth Five-Year Plan, it is necessary in the shortest time periods possible to solve all questions, having given the ministry the possibility to conduct the experiment in full measure. Taking into consideration that several construction organizations of Lithuania, the Ukraine, Uzbekistan, Moscow and Leningrad Oblast have been transferred to this system, the following is needed:

1. To provide for implementing the decisions made in the Decree of the USSR Council of Ministers in regard to the economic experiment, primarily - the USSR Gosplan, the USSR Central Statistics Administration, the USSR Ministry of Finance, the USSR Stroybank and also other directive organs.

2. To take further measures for improving the plannins system. To strengthen the responsibility of customers and contractors for fulfilling the plans for capital construction establish the following system:

-the construction organizations as basic indicators of construction production must plan the assimilation of projects and commodity construction product as a cost estimate of the completed construction projects;

-the construction organizations as the manufacturers of a finished product must plan work volumes each year, based on the technology of construction and approved time periods for assimilation;

-capital investments should be allocated to the customer in the year that the construction projects are assimilated for payment of the finished construction product accepted from the contract organizations;

-the customers expenditures for planning and surveying work, the acquisition of equipment and its installation should be covered by credit from the Stroybank and Gosbank; in the event that there is a disruption in handing the project over for operation the customers share with the construction organizations the responsibility in the amount of 2 percent - in the case of an overdue payment up to three months and 5 percent when it is greater than three months. To establish a system by which the main machine building plants deliver all equipment and take care of its installation and adjustment. The customers pay for the equipment only after this work has been completed.

3. All customers must in the near future coordinate two-year (for 1980 and 1981) plans for the assimilation of production capacities and construction projects with the Belorussian SSR Ministry of Industrial Construction.

4. All ministerial customers must devise and present prior to 1 January 1980 to the Belorussian SSR Ministry of Industrial Construction a five-year plan of contract jobs for 1981 through 1985 for coordination.

5. The Belorussian SSR Ministry of Industrial Construction must draw up, and the USSR Ministry of Industrial Construction review and approve in 1980, a plan for the construction of a production base for the ministry for 1981 through 1985.

6. Completely adopt the progressive system of supply "Snab-stroyka" [from the supply organization directly to the construction site], supplying in an established time period the projects under construction with materials in the full amount, the required product list and assortment.

Towards this goal the USSR Gosplan and the USSR Gossnab must solve the question about the sources for covering the gaps between the requirements for resources, which are determined according to structural norms and on the basis of plans and estimates.

7. Raise the role of USSR Gosstroy in questions of watching over existing standard regulations and instructions. To extend to USSR Gosstroy real rights to exclude from the plan or to suspend the erection of projects, which are not prepared for construction (due to the lack of estimates, plans for organizing the construction or the confirmation that the customer has not been allocated equipment).

8. Switch to planning the growth of labor productivity by taking into consideration the labor-intensiveness of the work being performed. Include scientific-research institutes in the development of a methodology on this question.

9. Swithch to planning the wage funds and their payment to construction organizations based on the labor-intensiveness of the work.

10. Permit the Belorussian Ministry of Industrial Construction to conduct over a period of several years (1979-1980) an experiment for determining the manpower requirements of the management apparatus and the outlays for its maintenance based on the peculiarities of technology and the structure of production within the limits of the approved wage funds and profit at the disposal of the ministry.

11. In order to establish equal material responsibility of the customers and the contract organizations for the fulfillment of contract obligations introduce into the rules for contracting capital construction the appropriate changes and additions (proposals on this have been submitted to the USSR Ministry of Industrial Construction).

12. The Belorussian SSR Gosplan, the Belorussian Ministry of Construction Materials and the Belorussian SSR Gossnab are to organize the manufacture of progressive materials and provide for their delivery in required amounts in order to lower the labor intensiveness of construction and to eliminate wet processes in building conditions (linoleum on a warm foundation, fused roofing material, hard mineral slab, gypsum concrete partitions for public buildings, dry plaster of increased durability, etc.).

The basic task of the Belorussian SSR Ministry of Industrial Construction for the years 1979 and 1980 is to ensure the fulfillment of the assignments for the Tenth Five-Year Plan for assimilating projects and capacities. In these goals for the remaining period of time it is necessary to assimilate 85 capacities of the national economic plan, 4.3 million square meters of housing, children's institutions to handle 24,900 spaces, schools for 53,300 students, hospitals with 3,700 beds, polyclinics to handle 3,500 out-patients and many other projects with a total amount of commodity construction product of approximately 1,900,000,000 rubles.

The ministry is carrying out purposeful work to eliminate the lag in assimilating projects and capacities and particularly industrial projects.

The basic direction of the ministry's work is the use of internal capabilities and reserves. In the second half of 1978 the ministry organized a massive review of the reserves of construction production in these areas: the conservation of material resources; reduction of losses of work time; the adherence to technology and the organization of production; the improvement of project solutions; the adoption of new technology; granting the work front to subcontractor organizations; working with the customers (technical documentation, contracts, equipment and assistance from the customers); labor productivity; profit; the engineering preparation of construction; the organization of construction sites; the quality of production; the storage and stockpiling of materials; the elimination of above-norm reserves of materials and constructions.

The planned measures taking into consideration the actual fulfillment of the plan for 1976 through 1978 will help the ministry to achieve an increase in the assimilation of fixed capital in the Tenth Five-Year Plan in comparison with the Ninth Five-Year Plan somewhere in the neighborhood of 40 to 42 percent, of commodity construction product from 38 to 40 percent, of the total amount of construction and installation work from 20 to 22 percent with provision for the assimilation of all national economic capacities and housing and social and cultural projects planned for the Tenth Five-Year Plan. The anticipated reduction in the time periods for the duration of construction work is 20 percent, the amount of unfinished construction work is in the limits of the norm.

The republic has been included in the socialist competition for the timely and ahead-of-schedule assimilation of projects in 1979 and 1980; this will help to combine the efforts of all participants in construction, which are aimed at improving construction work, overcoming additional difficulties

which are connected with the worsening of meteorological conditions at the beginning of 1979, as well as the unsatisfactory operation of railroad transport in the shipping of construction materials and constructions.

The collective of the Belorussian SSR Ministry of Industrial Construction, while sensing the constant help and support from the Central Committee of the Belorussian Communist Party, the Belorussian SSR Council of Ministers and the local party and council organs, is full of determination to provide for the successful conclusion of the plan for the Tenth Five-Year Plan.

8927
CSO: 1821

MECHANIZATION: SUBSTITUTE FOR LABOR DEFICIT

Moscow EKONOMICHESKAYA GAZETA in Russian No 33, Aug 79 p 2

[Article by E.S. Novoselov, Minister of Construction and Municipal Road Building Macninery, in answer to earlier article]

[Text] In the review "Construction and Road Building Machinery" published in the 27th issue of EKONOMICHESKAYA GAZETA, an objective in-depth analysis of production activity was presented and the sectors were justly criticized for their shortcomings in their work.

In 1979, more than 60 factories of the ministry made counter-productive plans. At the expense of optimum utilization of reserves and local resources, the factory collectives were obliged to manufacture additional products valued at one million rubles. Together with this, as correctly noted in the review, there are unions and factories which do not guarantee the fulfillment of their planned assignments in the current year and which are not working in harmony.

At present, control over the work of the factories has been strengthened, their results have been analyzed from all sides, and relief measures have been implemented. Every decade the progress of fulfilling the plan is examined by the minister's assistant, and each section by the minister's colleagues. After discussion of the results of the laggard enterprises to account. A period for completing the deficit production was established. The collective sent responsible works of the Ministry of Construction and Road Building Machinery to the laggard enterprises to render practical assistance.

The Ministry of Construction and Road Building Machinery continually perfects manufactured machinery and equipment, improves their technical level and quality, and also creates new, more effective and safe models. Many innovations have been developed during the 10th Five-Year Plan.

Yet, just the same, the EKONOMICHESKAYA GAZETA in its review correctly pointed out the manufacture of outdated machines by several enterprises, especially

the factories Soyuzdormasha and Soyuzstronnashiny. We are often forced to manufacture both products over the course of a long period of time only because we do not have the proper basic new machinery, diesels and complementary products. EKONOMICHESKAYA GAZETA was completely justified in noting that renovation of production is hindered in a number of instances due to the fault of others indirectly involved--the suppliers of basic machinery. For example: there are no suitable tractors for the 300-500 horsepower bulldozers and scrapers. The USSR Minchermet does not supply thermo-treated rolled metal in sufficient quantity and does not produce steel of improved durability for machines used in northern regions. As to the Skolpinsky factory, since June 1 it has shifted to production of the modernized CO-50A mortar pump instead of the outmoded CO-50 pump which was justly criticized in the review.

The increased quota for establishing the serial production of new machines and for removing outmoded designs from production is affirmed. Instead of the 104 products projected by the five-year plan for removal from production in 1979-1980, it was stipulated that 219 will cease being produced, 113 of those in 1979. In addition, the task of modernizing machinery and equipment for 286 items was established.

The Ministry of Construction and Road Building Machinery is working to create a means of mechanizing labor for 12 labor consuming sectors of the national economy, including construction, melioration, the building materials industry, the forestry and the peat industry of the municipal economy. At present, and especially in the ensuing five years, there is no other possibility of making up the deficit in labor resources in these sectors, except at the expense of the further mechanization of labor and the equipping of their new highly productive machines which have increased power and a high level of automation, and also at the expense of industrializing construction, of a wider use of components and of the formation of high factory and assembly readiness. The Ministry of Construction and Road Building Machinery prepared a scheme of measures for furthering the growth of construction, road and municipal machine building, for mechanizing construction and for equipping its highly productive technology for the 1981-1985 period. Its realization makes it possible to increase production of essential machinery to a level which would completely satisfy the demands of the national economy.

9495
CSO: 1821

ASBESTOS-CEMENT SHOP BUILT IN VOSKRESENSK

Moscow STROITEL'NAYA GAZETA in Russian 22 Jul 79 p 3

[Article by V. Skryabin, special correspondent: "The Country's First Large-Scale Shop for the Production of Asbestos-Cement Articles by the Extrusion Method Is Being Built in Voskresensk"]

[Text] This method is already well known. It is used in the ceramic, brick, and other areas. But can it be used in the asbestos-cement industry? A group of coworkers of VNIIProyektasbestotsement which was headed by section chief I. Volchek engaged in that elaboration and within a year obtained an affirmative answer. And this was not only under laboratory conditions, but also on an experimental technological line, where output was manufactured by the new method.

Such a rapid introduction of a scientific development became possible under conditions of the Asbesttsement scientific-production association, which includes the institute already mentioned, an experimental-production enterprise (OPP), and the Krasnyy Stroitel' combine in Voskresensk.

On the experimental line the scientists and production workers assimilated the production of wall panels in various modifications, roofing panels, and inside partitions, as well as channel bars and window sills. The essence of the production of all these articles by the extrusion method lies in the fact that the plastic asbestos-cement mass is forced by a screw press through a mouthpiece, which gives it the required form, in particular, the form of box-type panels.

These panels are made in lengths up to 6 meters, width 0.6 meters, and thickness from 60 to 140 millimeters. The hollow part of the "box" (70-75 percent of its volume) is filled with warming material made of semisolid mineral wool, which also is produced here, at the Krasnyy Stroitel' combine. The articles manufactured by the extrusion method are being used successfully in the experimental construction of agricultural and public buildings.

But the area of their application can be much broader. Extrusion-type panels are less expensive than ceramic-concrete, and the amount of labor

required to produce them is almost one-half. For each square meter of structural element, there is a saving of 10 kilograms of metal, since the extruded articles are made without any reinforcement. In addition, the production of these articles itself, as compared with the traditional method, is much less polluting to the environment. It does not require the construction of stations for neutralizing the runoff water, settling tanks, or purification structures.

After the complete experimental checking of the production and use of the new structural elements, the people at Krasnyy Stroitel' began to construct a large-scale industrial shop, the first phase of which is planned for a production of 500,000 square meters of extruded panels a year. Its activation is planned for the fourth quarter of this year, and a second similar line will be activated next year. Incidentally, the construction of the shop has already employed extruded guard slabs that are produced on the experimental line.

Unfortunately, the construction is, for the time being, lagging behind the schedule, and all its participants do not have an equal awareness of the importance of the complex that they are building. The half-year's plan for the general contract has been fulfilled by 90.3 percent, although the general contractor -- SMU-6 [Construction and Installation Administration No 6] of Mosoblstroy Trust No 5 -- implemented the assignment by 131 percent. The plumbers and the finishers also worked well. But this cannot be said about the other subcontractors, particularly the administrations of Mosoblelektromontazh, Mosoblteplomontazh, and the Stal'konstruktsiya Trust. In particular, the Kostroma and Bryansk Administrations of Stal'konstruktsiya lagged behind the schedule by approximately a month. As long ago as March, Minmontazhspetsstroy was supposed to deliver to the construction site all the metal structurals; however, its Voronezh plant has not yet shipped the aluminum window elements or parts for the gas conduits.

Also failing to provide the prompt delivery of the technological equipment is the customer itself -- the Krasnyy Stroitel' combine. All the overhead cranes and automatic equipment have not yet arrived at the construction site, and yet it is time to cover over the open areas of the building.

The construction site has failed to extend the competition based on the "Worker's Relay Baton" principle, although the reciprocal assistance and support of the participants in the construction of the shop would do much do help the job. For example, the installation workers at the Voskresensk Administration of Minmontazhspetstroy Trust No 7 and the Bryansk Administration of Stal'konstruktsiya are working side by side, but are making no effort to meet each other halfway, not even in small matters. For example, one of them will ask to borrow a pipe installer temporarily, but the other person won't give it to him. The latter, in turn, will need the help of the crane operator, and all he will get is a refusal.

The brigades at SMU-6 are working at a shock-worker rate, but even they

can prove to be without anything to do, because of the fact that the designers at VNIIProyektasbestotsement have not issued all the blueprints for the foundations to go under the equipment on the technological lines. These lines themselves are still being modified at the Strommash Plant in Mogilev.

And there is yet another fundamental question that pertains to the introduction of the new technology. With the extrusion method, methyl cellulose is used as the plasticizer. On the experimental line, approximately 100 tons of it is used each year, but the industrial shop will require 5 times more. And yet, even now one can sense a shortage of this plasticizer, which is supplied by Minkhimprom enterprises. In addition, the methyl cellulose requires a low content of alkalis in the cement and a temperature in the cement of up to 30 degrees. It is rather complicated to observe these conditions. The chemists have already been given the assignment of developing a more suitable plasticizer, and they must show more haste in carrying out this assignment.

5075
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ELECTRONICS AND PRECISION EQUIPMENT

RADIOELECTRONICS YESTERDAY, TODAY AND TOMORROW

Minsk PROMYSHLENNOST' BELORUSSII in Russian No 4, 1979 pp 51-54

[Article by V. Samtsevich, Deputy Chief of the Department of Machine-Building, Radioelectronics and Instrument-Making, Belorussian SSR Gosplan]

[Text] The radio and electronic industry, the production of means of communications and instrument-making occupy a special place in the republic's industry. And this is understandable. Their products constitute the technical basis of the automation of production and control of the national economy, as well as of scientific research. The development level of these advanced branches of machine-building determines to a considerable degree the scientific, technical, and economic potential, as well as the prospects for the development of the economy of the country and the republic. The application of electronics, computer techniques, monitoring devices, and complete measuring systems increses the degree of automation and productivity of machines, units and technological processes, reduces labor input and improves working conditions.

Let us say a few words about the history of the development of these industries. The first products of the instrument-building industry -- table and merchandise scales -- were produced as early as in the 1920's by the Minsk Mechanical Plant "Energiya" (now, Plant imeni October Revolution). In the thirties, the Vitebsk Eyeglasses Factory (now, Plant of Electrical Measuring Instruments) produced eyeglasses and binoculars. The first radio engineering products -- the simplest radio receivers -- were produced by the Minsk Radio Plant in 1940.

However, radio and instrument building started developing chiefly during postwar years, when the second radio plant, a watch plant, and a plant of electronic computers were build in Minsk. Various small enterprises were used as a basis for creating the Vitebsk Plant of Electrical Measuring Instruments, Vitbesk Plant of Watch Parts, and Orsha Plant "Krasnyy Oktyabr'".

At the present time, the complex of the radio and electronic industry, production of means of communications, and instrument-making includes dozens of large associations and enterprises, scientific, research, technological-design, and planning organizations. They are characterized by a high level of

the concentration and skill of labor. Eight scientific-production and production associations producing structurally or technologically similar products were created. This contributed to the increase in the pace of production and labor productivity and improved all technical and economic indexes on the basis of the acceleration of the technical progress. Further specialization of enterprises and plants within the association with respect to their products, parts, and assemblies, as well as the creation of new specialized enterprises in the industry also had a substantial effect on increasing the effectiveness of production.

The share of products of the radioelectronic and instrument-building industries in the total volume of machine-building production has increased consiberably in recent years. These industries, which do not consume much metal but are relatively labor-consuming and require highly skilled labor, became the basis of the machine-building of the republic. At the present time there are 22 instrument-making enterprises. The most important of them are the following: Minsk Production Association of Computing Machinery imeni V. I. Lenin, Belorussian Opticomechanical Association, Brest Electromechanical Plant, Minsk Watch Plant, and Mogilev Plant of Devices for Preparation of Primary Information. Our enterprises produce 7.8% of the All-Union production of instruments and means of automation. The first place in the structure of this industry belongs to computing equipment, and the second place belongs to cultural and household goods, such as mechanical and electronic watches, photocameras, and slide projectors. An important role is played by instruments for monitoring and regulating technological processes, primary measuring converters of electrical values, and measuring amplifiers.

In the Tenth Five-Year Plan, these advanced industries continue to develop faster than the entire machine-building industry. During the five-year plan, the output of instruments and means of automation has increased 2.5-fold, and that of computing equipment 2.3-fold.

In the past three years of the five-year plan, the growth of the production volume for this group of industries constituted (according to preliminary data) 190%. Labor productivity increased 1.6-fold.

How these results were achieved? It should be mentioned that during this five-year plan, just as during the preceding five-year plans, large capital investments are allotted for the construction of new enterprises, as well as for the expansion and reconstruction of the existing enterprises. Just as during the Ninth Five-Year Plan, the cost of the fixed production capital will more than double. This group of industries is characterized by a wide variety of technological processes used, a relatively high level of the extent of equipment with modern highly productive precision devices most of which is automatic and semiautomatic, automation of the installation, assembly, and control operations with the use of electronic programming units and electronic computers, and the introduction of automated systems for controlling technological processes and the entire production at large enterprises and in production associations. In the mechanical processing industry, the number of machines with numerical program control is increasing, which creates the necessary prerequisites for the transition to the next stage -- creation of whole

fully automated sections with such machines controlled with the aid of an electronic computer. This direction in the automation of the metal-working industry is very promising and effective.

At the present stage of development, more and more importance is attached to overall mechanization and automation of production processes, sections, and shops. The next step in this direction is the use of a new type of machines: programmed manipulators (industrial robots) which must replace manual labor of hard and monotonous auxiliary operations, such as loading and unloading presses and casting machines, as well as of some assembling, welding, finishing, and other jobs. Several of such robots have already been built by the workers of the Minsk Instrument-Making Plant imeni V. I. Lenin and "Termoplast" Plant and are used there for loading and unloading their presses. A specialized design organization is developing and preparing for introduction a number of systems for overall automation of production, including robots for the enterprises of this industry.

Extensive work on the development, manufacturing, and introduction into production of various automatic and semiautomatic equipment, automated measuring devices and systems for the automation of installation, regulating, controlling, and assembling operations is being done in production associations of computing equipment "Integral", "Gorizont", imeni V. I. Lenin, and "Monolit", Minsk Watch Plant, Mogilev Plant of Devices for the Preparation of Primary Information, and others. All of them have specialized departments or shops for making means of automation and special technological equipment. Equipment created in the electronic machine-building industry is characterized by a high technical level. A group of leading specialists of a design bureau of precision electronic machine building was awarded the USSR State Prize of 1977 for creating a complex of automatic precision opticomechanical equipment for microelectronics. The production association "Monolit", in collaboration with the Scientific Research Institute of Heat and Mass Exchange of the Belorussian SSR Academy of Sciences, developed, manufactured, and introduced the means of overall automation and advanced technology for mass production of tubular electric ceramic capacitors of the KT type. This equipment made it possible to replace manual labor in nearly all technological operations (the share of manual operations was reduced from 63 to 4%) and to increase labor productivity 4.2-fold. At the present time, new automatic lines are being introduced in the production of monolithic capacitors. This will make it possible to reduce the labor input in them to one half.

At the present time, conveyors are being introduced for assembling and installation at automated work places or sections. For example, the Minsk Plant of Electronic Computing Machines has 40 semiautomatic devices for assembling units by turning which have a prescribed program to ensure faultless and reliable connections. So far, mechanical connections at these semiautomatic work places are done by human beings. However, it is planned to automate this operation also.

During the last five-year plan, the Minsk Watch Plant initiated the transition from conveyor assembly of watches in a forced rhythm to conveyors of element-by-element assembly which allows to work in an individual rhythm. This makes it possible for the assembly line workers to use their potentialities better and to increase labor productivity by a factor of 1.5. At the present time, the plant is introducing an assembly system of a higher level consisting of automated sections. The lines are constructed on the unit principle, which ensures flexibility in operation and will make it possible in the future, when the system develops further, to automate more than 85% of intermediate assembly jobs.

The level of the assembly technology in the production of opticomechanical instruments and equipment looks very low against the background of these achievements. Therefore, one of the most important problems of the Belorussian Opticomechanical Association is to develop and produce new more technologically feasible designs of photographic cameras, as well as to develop its own experimental and production base for creating and producing the means of mechanization and automation.

Administrators of enterprises understand clearly that the raising of the technological level of production on the basis of its mechanization and automation, just as the growth of labor productivity, solves important social problems replacing the monotonous tiring work of conveyor-type assembly with creative labor of the operator controlling automatic or semiautomatic equipment. New professions characteristic of automated production, as a rule, are distinguished by a higher general-educational and professional training. Only highly skilled workers can work at enterprises of the radio, electronic, and communications industries which have more than 300 mechanized flow lines and automated lines, and over 30-70% of shops and sections are fully mechanized and automated.

The new qualitative development of modern radioelectronics and instrument making is based on the use of microcircuits of various complexities. The greater functional saturation of the modern equipment, radioelectronic systems, and high-speed electronic computers requires a wide use of multilayer printed-circuit cards which make it possible to solve the difficult problem of switching of the circuit components. The multilayer printed circuit card is a complex device which imposes new requirements on the materials, technological processes, technological equipment, and production premises. Their production requires the training of specialists. This characteristic made it necessary to create specialized shops for the production of microcircuits and single-layer and multilayer printed-circuit cards at many enterprises.

Enterprises of the radioelectronic and instrument-making industries made a considerable contribution also in the creation of control systems affecting all activities of plant personnels intended for improving the quality of the products and work of each worker. The complex system of the organization of defect-free work and ensuring the output of high-quality products developed and introduced at the Minsk Plant of electronic computers imeni G. K. Ordzhonikidze is used widely. At the present time, the experience of the Vitebsk

Production Association "Monolit" is being studied. They are introducing a complex system for controlling the effectiveness of production and quality of products. This system includes a complex of political-educational, technical-economic, and organizational measures implemented on the basis of special-purpose program methods of planning.

The revision and expansion of the list of products of the radioelectronic and instrument-making industries, as well as their increased complexity impose more stringent requirements upon the quality, the design deadlines and effectiveness of the work of designers and services of technical preparation of production. One of the ways of solving this problem is the introduction of systems of automated designing of products, as well as of automated systems of planning technological processes. Considerable advances were made in increasing the effectiveness of work of design engineers in the production association "Integral" and the Minsk Scientific Research Institute of Electronic Computers. Elements of automated systems for planning technological processes of component processing and the designing of dies and other devices are being introduced successfully at production associations "Gorizont", imeni V. I. Lenin, BelOMO [expansion unknown], Minsk Watch Plant, and Brest Electromechanical Plant. These systems make it possible to reduce the labor consumption of designing to one sixth or one tenth.

The increase of the organizational level of production, its mechanization and automation ensured a high stable pace of labor productivity growth. During the Ninth Five-Year Plan, average annual rates were 19.9%, and for the two years of the Tenth Five-Year Plan they were 17%. It is characteristic that the rates of growth of labor productivity exceed the rates of growth of the capital-labor ratio, while the volume of production increases faster than the cost of the fixed industrial and production capital.

The radioelectronic industry, production of means of communications, and the instrument-making industry are characterized by constant expansion of lists of their products, the predominance of small series of their production, and rapid changes in their models. The renewal of models is accompanied by the growth of the technical level of the products whose most important indexes are the increase of the degree of automation of the processes of data measuring and processing, accuracy and reliability of the devices and the apparatus, and the expansion of their functions. The rapid renewal of such complicated products as electronic computers can serve an an example. In 1977, the production of ES-1020 computers was discontinued and they were replaced by a new ES-1022 model. At the present time, the production of more productive computers ES-1035 and ES-1060 is increasing. During the five-year plan, most of the enterprises replaced their list of products almost completely and even did it twice with respect to certain types of products. The high technical level and quality of products in radioelectronics and instrument-making is indicated by the stable growth of the share of high-quality products. By the end of the five-year plan, this index will, on the average, reach 45-50%. Even today, their radio and electric measuring devices, precision measuring optical devices, movie projectors, electronic computers, radio components, radio receivers, watches, and photographic cameras are exported to more than 60 countries of the world.

The technical level of radioelectronic and instrument-making products is raised by improving the existing types and creation of new models and complexes of instruments with the use of new principles and processes of measurement, monitoring, data processing, and control. The limits of their sensitivity, resolving power of optical systems, reliability in operation are raised and their weight and dimensions are reduced. The development of new models is done on the basis of systemic methods of designing. Advanced principles of aggregation and standardization are used widely and functional series and families of products are created with ensurance of their power, informational, and structural compatibility. For example, the means of computing techniques are perfected on the basis of the created Unified System of Electronic Computing Machines and Aggregate System of Means of Computing Techniques (ASVT). Each of these systems is constructed in the form of a family of machines using compatible programs and standardized external devices having a single design and technological basis of microelectronic engineering. As new microelectronic circuits with higher speeds and level of integration appear, the Unified System is enriched with new models of electronic computers. For example, the introduction of large-scale integrated circuits made it possible to produce new models of electronic computers of medium productivity (160,000-180,000 operations per second) ES-1035 and of high productivity (over one million operations per second) ES-1060. These models are machines of qualitatively new class of electronic computers designed on a new microelement base -- large-scale integrated circuits with the use of semiconductor immediate-access memory. The use of the new element base makes it possible to increase substantially the technical and econimic indexes of electronic computers: quick operation, communication channel capacity, and effectiveness (cost-productivity ratio).

Along with increasing the output of new machines of medium and high productivity, we are gradually switching from producing individual electronic computers to producing multimachine and multiprocessor-type computing complexes which include external devices and means of teleprocessing. This will increase the effectiveness of the utilization of computing equipment and will help in creating large information and computing systems and computing centers for collective use.

One of the most important directions in the use of computing techniques is the automation of designing. For these purposes, the republic has created and develops specialized production of technical means -- automated work places (ARM). It is a dialogic graphic designing complex for collective use. The technical means in it are constructed on the bases of advanced achievements of technological design with the use of integrated circuits. All these means and the basic software of the complex make it suitable for processing any type of graphic and textual information. The specialization of the complex is determined by the applied problems introduced into the operating system and by the content of the information base which is formed and corrected by the user on the basis of the concrete problems being solved.

10,233
CSO:1821

BRIEFS

NEW MULTICORE CABLE -- Odessa -- The Odessa Cable Plant started producing a multicore telephone cable of a new design. Its main feature is that it requires less metal than previous designs. The difference in the diameter of the copper cores of 0.08 millimeter seems to be insignificantly small but it will make it possible to reduce the consumption of nonferrous metal by nearly 10 tons a year. In spite of its lighter weight, the cable retained its high strength and reliability. This was achieved with the help of the scientists of the Odessa State University imeni I. I. Mechnikov. A university laboratory was organized at the plant for nondestructive methods of inspecting conducting materials. The physicists were also given an experimental shop. At the present time, the enterprise is producing one half of all cables on the basis of economical designs. Yu. Mikhalyuk. [Text] [SOTSIALISTICHESKAYA INDUSTRIYA in Russian 9 Aug 79 p 2] 10,233

NEW CLASS OF LIQUID CRYSTALS -- It is unlikely that many owners of electronic watches know that the time on their watches is indicated by a drop of liquid which acts as a crystal. It is this drop that writes the figures on the indicator, replacing the usual face of the watch. The scientific world became interested in "sensitive liquid" not too long ago. However, it has found many applications many of which were developed by the young scientists of the Vil'nyus State University. TASS correspondent S. Vayntraubas, who visited the university laboratory of liquid crystals, reports that its scientists have recently synthisized a new class of liquid crystals, ether hydrochemicals, and created complex compositions on their basis. The materials developed here have been introduced at a number of plants of the country and are used widely in new electronic watches, miniature calculators, and other microelectronic devices. [Text] [Baku Vyshka in Russian 9 June 79 p 3] 10,233

NEW TV RELAY STATION -- Donetskaya Oblast' -- A television relay station is under construction on the historic Karachun Mountain between the cities of Slavyansk and Kramatorsk. A high-voltage electric power transmission line has been laid, a water supply system and an asphalt road have been completed, and the construction of a two-story building and other auxiliary facilities is nearing completion. The concrete foundation has been laid for a television tower which will be 220 meters tall. The installation work is being done by the administration "Stroykonstruktsiya" No 113. When the new relay station starts operating, the population of the northeastern part of

Donetskaya Oblast', Kramatorsk, Slavyansk, Konstantinovka, Druzhkovka, Krasnyy Liman, as well as of many rural populated centers will be able to receive two television programs. According to the head of the Donetsk production and technical communications administration, V. Delikatnyy, it is planned to deliver the relay station in 1981. [Text] [RABOCHAYA GAZETA in Russian 2 Aug 79 p 2] 10,233

GAS-DISCHARGE MATRIX-TYPE INDICATOR -- IMG-1 is the first domestically produced general purpose device using a matrix-type display panel controlled by an integrated circuit. This device converts electrical signals to a visible image consisting of individual light elements and displays digital, graphic, and histogram information; it creates a great possibility for microminiaturization of radio electronic equipment for computers and measuring machinery, as well as various devices for displaying information in the medical industry, printing, communications, machine-tool manufacturing, petrochemistry, and atomic power engineering. It reduces the size of multichannel meters to one tenth or one thirtieth of their size by replacing cathode-ray tubes in them or devices with a light display. It makes it possible to create measuring devices of fundamentally new classes, for example, digital oscillographs. The economic effect from using just one such unit in multichannel analog-digital converters, spectrum analyzers, cathode-ray curve tracers and other devices will amount to several thousand rubles. This indicator was awarded a second prize at the All-Union competition in overall microminiaturization of radio electronic devices and has seven patents. Brief specifications: information capacity -- 10 to the fourth power (100 x 100) of elements; light display color -- orange-red; brightness -- at least 50 cd/kv. m; supply source voltage -- 5 V(40mA), 250 V(100mA); minimum operating time -- 1000 h, dimensions -- 145 x 145 x 67 mm, power intake -- 10 W; weight -- 0.8 kg. The price of the indicator in small series production is 900 rubles with subsequent decrease to 500 rubles for series production. Specifications -- ODO.339.165 TU. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 28, Jul 79 p 23] 10,233

ALL-PURPOSE DISPLAY DEVICE -- PIU is the first domestic all-purpose display device for displaying practically any signs on the basis of a gas-discharge display panel with automatic scanning. It makes it possible: to display all capital and lower-case letters of the Russian and Latin alphabets, as well as a major part of the Greek alphabet, Arabic numerals, mathematical symbols, and other notations; to clear the display field without disturbing the written information. The device has good illumination-engineering and ergonomic characteristics when working round the clock; it has a high data input speed (up to 20,000 symbols/sec); it is possible to regulate the brightness of the display symbols (from 50 to 140 cd/sq.m) in dark rooms; its power consumption is low (7.9 W); it is compact (220 x 72 x 180 mm) and is light (2.5 kg). All this makes it possible to use the PIU widely in all sectors of the national economy using electronic computers, automatic control system equipment, photolettering equipment, industrial automatic devices, programmed machinery, and monitoring and measuring equipment. The PIU is particularly advantageous in devices where information is presented in a coded form, because it ensures its conversion to a form convenient for the operator. Brief specifications:

number of symbol spaces -- 16, symbol size -- 7 x 10 mm (with a format of 5 x 7 elements), set of symbols displayed in each symbol space -- 192 symbols; power supply voltage -- plus 5 ± 0.15 V and minus 12.6 ± 0.2 V; mean cycles between failures -- 2000 hours; 8 information and 4 control inputs are coordinated with TTL [expansion unknown]-logic. The device is connected by means of a 2RM-type plug and socket unit. Price of experimental specimen -- 1600 rubles. Specifications -- ODO.304 001 TU. Delivery conditions -- through direct contracts. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 28, Jul 79 p 23] 10,233

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MODEL 5000 ROLLING MILL UNDER CONSTRUCTION AT KRAMATORSK

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 12 Aug 79 p 1

[Article by correspondent G. Dorofeyev: "Birth of a Giant"]

[Excerpts] At the Novokramatorsk Machine Building Plant, the construction of the model 5000 rolling mill is proceeding in parallel with its planning. The equipment for the giant rolling mill has already begun to reach the metallurgists of Belaya Kalitva.

A large group of plant specialists is working on the 5000 project together with scientists of VNIImetmash [All-Union Research Institute of Metalworking Machinery].

"The planning of this new unit," says chief rolling equipment designer V. Ponomarev, "was begun rather recently, but it is now already in the concluding state. Let me also say that we are not novices in the development of rolling mills. Our units are operating in all of the country's metallurgical plants, but the 5000 cannot be compared with any of them."

Indeed, none of the mechanisms of this giant has a parallel. The rolling force, for example, will reach 14-15 thousand tons. This is three and a half times as great as in the units currently operating. The mill will roll sheets 4.5 meters wide and 39 meters long. In its output and features, the unit is equivalent to an entire plant.

The design of the mill is of unique scope as regards the complexity of manufacture as well. The weight of the support roll is 170 tons and that of the mill stand housing 780 tons. The difficulties involved in creating such parts arose simultaneously. It suffices to say that in order to solve the problems associated with the manufacture of the support roll, five scientific research institutes had to be called in. In order to meet a series of problems it was necessary to make full-size mockups of the parts. This work was carried out by the collective of the 5th Department, which specializes in making rotating parts weighing 36 to 170 tons.

The machine builders came to grips with serious problems when the question of joining the various parts arose. These problems too have been solved.

"Find a weld here," Deputy Director A. Nadtochenko of the Scientific Research Institute of the NKMZ [Novokramatorst Machinery Plant] production association told me.

I looked carefully at the surface of the part and found none.

"Here it is," Andrey Fedorovich showed me. "It really is difficult to find with the naked eye."

The builders of the rolling mill are successfully fulfilling this year's program. As a result of improved manufacturing processes and better production organization along, the plan for growth of labor productivity was overfulfilled by more than 10 percent. The shop has no laggard brigades or sections.

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INCREASED MECHANIZATION IN FORGE-PRESS INSTALLATIONS URGED

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 15 Aug 79 p 2

[Article by Candidate of Technical Sciences V. Karzhan, Chief Designer, Voronezh Association for Production of Forging and Press Equipment imeni Kalinin: "Forging: An Area for Automation"]

[Text] The section entitled "Shift Manual Labor to Machines" which SOTSIALISTICHESKAYA INDUSTRIYA is running has attracted me as a designer by its relevance. In their articles on this important subject, the authors have quite correctly required of the designers that they change their attitude toward mechanization and automation of auxiliary operations.

It is a reasonable demand. The title of designer itself compels us to think about creating new mechanisms which will eliminate as much heavy labor as possible. After our enterprise specialized in the production of forging and press equipment, we developed more than 300 plans for machines. These machines, from the simplest friction presses to automated lines, differ in use, manufacture and appearance. But this is what deserves attention: in the vast majority of cases this equipment has been produced and still is being produced without mechanization and automation facilities for loading and unloading of parts.

What is keeping the designers from doing this? The main reason, perhaps, resides in the fact that the manufacturers of our equipment and similar types find it economically disadvantageous to undertake "additional" work--the development and manufacture of equipment for mechanizing loading and unloading of parts. In addition, we do not have the proper production conditions for producing the equipment to mechanize auxiliary work.

What to do, then? One realistic way of solving this problem is to develop automated equipment complexes. These could include one or more forging machines connected by automatic equipment for unloading and loading the workpieces. The automated equipment in these complexes would make it possible to reorganize them quickly for production of different parts.

Since the beginning of the Tenth Five-Year Plan, we have started the planning and later the production of small lots of single-machine automated complexes based on the KD2330 series-produced presses. Industrial robots have been used in their design.

The incorporation of such complexes makes it possible to automate series and small-series production, in which multipurpose equipment is utilized. Its productivity has been doubled.

But the problem is that the labor consumed in manufacturing mechanization equipment for presses is two or three times as great as that consumed in making the machines themselves. This means that we still cannot speak of large-series production of the equipment complexes, whose effectiveness in the national economy is apparent. What is the solution? There are two points of view in this regard. It would be possible to significantly increase the output of these complexes, temporarily, for a specific period, without creating additional production capacities, by decreasing the amount of forging and press equipment produced. The other way is to organize new capacities for the production of mechanization equipment in specialized plants.

The second approach, of course, requires considerable time. Accordingly, in our view it is more advantageous at present to decrease the amount of nonautomated equipment produced and increase the production of automated complexes.

I should also like to direct attention to other aspects of the development of automated euqipment. The time has come when the designer must develop equipment not for all eventualities but for the specific production task that has been assigned. Then it will be possible to achieve significant savings of metal and labor by using forging machines to produce parts which do not require further machining.

We frequently see such possibilities. But the purchaser generally refuses, being unwilling to disrupt the existing classical production technology. Here is an example. Not long ago we were involved in the planning and later the production of mechanized flow lines for the manufacture of parts for truck wheels. The process developed by the Central Design and Engineering Bureau for Wheel Production (TsKTB KP), according to which the first line was being planned, called for an operation using manual labor. On this "basis" it is impossible to develop a reliably-operating line. In this case, fortunately, the designers succeeded in convincing the purchaser to reconsider the backward technology.

Sometimes people tell us that pressure working processes would be automated with a selection of standard machines. This is an erroneous point of view. Automation processes are more successfully incorporated if special presses, complexes and lines based on series-produced machines are planned for the individual parts of groups of parts. For the incorporation of loading and unloading mechanisms requires a larger forging space, a change in the number of strokes and so on.

The decree of the CPSU Central Committee and the USSR Council of Ministers "On Improving Planning and Strengthening the Effect of the Management Mechanism on the Improvement of Production Effectiveness and Work Quality" discusses the necessity of securing approval of a list of special comprehensive scientific-technical, economic and social programs before the beginning of the next five-year plan. A program for decreasing the use of manual labor is named as a top priority near-term project. It seems to us that questions of mechanizing forging and pressing equipment should be reflected in it.

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METALWORKING EQUIPMENT

PLASMA DEVICES USED IN METALWORKING

Kiev RABOCHAYA GAZETA in Russian 20 Jul 79 p 1

[Article: "Plasma, the Lathe Operator's Helper"]

[Text] Leningrad--An unusual tool, the plasmotron, has been installed on the carriage of a large lathe of the Izhorskiy Zavod association. It is used to soften the outer layer of metal, after which the cutter can easily remove the superhard "skin" from a 40-ton steel blank. The company has begun to use this advanced plasma-mechanical method to machine castings for a power production unit with a capacity of 1.5 million kilowatts.

This is a new area of employment for plasma technology, which now not only cuts and welds metal, but also takes part in its machining. By making plasma the lathe operator's helper, the association has speeded up the dressing-off of high quality steel, which is used to manufacture nuclear power station equipment and the rotors of powerful turbines and generators, by a factor of 5. Not long ago such a blank would be ground for 10 shifts, using up dozens of cutters. The action of the plasma arc on the metal surface has made it possible to carry out this work in a shift and a half, using up considerably fewer tools.

The association developed the plasma lathe and plasma planer with the help of scientists from the All-Union Scientific Research Institute of Electric Welding Equipment. Plasma cutting of metals is in extensive use. The organization has become a renowned center for the incorporation of advanced technology. The experience of the workers at Izhorskiy Zavod is being disseminated to other enterprises in the country.

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STATUS REPORT ON KHAR'KOV MACHINE TOOL PRODUCTION ASSOCIATION

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 11 Aug 79 p 2

[Article by K. Shelkovyy, General Director of of the Machine Tool Production Association: "A Cut Above"]

[Excerpts] Concerning themselves with the interests of the consumer, the workers and specialists of the Khar'kov Machine Tool Production Association have been constantly changing the structure of their equipment, increasing the production of automated units and automated lines and semiautomated units with numerical program control in their total production.

The new models, developed during the current five-year plan, will make possible an increase in labor productivity by a factor of 1.5-2.5 with extremely high precision and cleanness of machining. Not content with this, our designers have begun to prepare the engineering requirements for the production of a family of tools with an even higher engineering level.

It is understandable that the improvement of the product is the responsibility of all members of the collective. However, I should like to identify several factors which have had a particularly strong influence on the engineering level of our products. Most important is the contribution of the Experimental Grinding Tool Design Bureau (OKBShS), which is an independent structural subdivision of the association.

I should add that in developing new models of machine tools and automated lines, the designers give particular attention to assuring their reliability and durability while decreasing the amount of material they require. For medium-sized units, the time before a major overhaul has been increased to 8-9 years, and that for large-sized machines to 10-11 years.

We are more and more convinced that the development of first-class grinding equipment is impossible without the participation of scientists. Accordingly, the association already has creative cooperation agreements with 16 scientific research and scientific institutes.

But we have still not managed to achieve "synchronization" with all our suppliers in developing new equipment. For example, we cannot increase our output of heavy automated machine tools with numerical program control, since we do not have the required numerical control systems. These systems are not being manufactured by enterprises of the Ministry of Instrument Making. Drives with high-torque DC motors and with powerful stepped motors are being put into production only slowly. It is also necessary to improve the quality of hydraulic equipment so as to improve the reliability of machine tools, and to accelerate the putting into production of hydraulic drives with volume control. We must also improve the quality of electrical engines significantly and to decrease vibration and noise levels.

Nonetheless, the fruits of our all-embracing concern for improvement of the engineering level of our products are apparent. The state seal of quality has been awarded to 11 models of our machine tools which are in series production. This year our output of products in the highest category is 47 percent of our total commodity output. The incorporation of better machine tools in the enterprises of various sectors will make it possible to raise the level of mechanization and automation of labor-consuming processes and to obtain an economic effect amounting to millions of rubles a year.

But the reserves, as they say, are still not exhausted. In particular, the association is not fully satisfying the national economy's requirements for special, heavy and large machine tools and for automated lines. The collective must accomplish a good many more complex assignments in order to further increase the output of high-productivity equipment.

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METALWORKING EQUIPMENT

BRIEFS

HIGH-QUALITY LATHES--Kramatorsk. The manufacture of KZh 93-09 lathe units has begun at the Kramatorsk Heavy Machine Tool Plant imeni V. Ya. Chubar'. In these, the operations of placing and removal of the workpiece have been completely mechanized, enabling the machine tools to work automatically. This new product has been awarded the State Seal of Quality. The first units have already been sent to the Denprospetsstal' [special steel] plant and the metallurgists of Elektrostal'. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 20 Jul 70 p 2] 8480

AES EQUIPMENT--Answer to SOTSIALISTICHESKAYA INDUSTRIYA by Deputy Minister of Power Machinery Building M. Neuymin. The article "When Their Partners Let Them Down," published on 8 June 1979 correctly xriticized the Podol'sk Machine Building Plant imeni Orzhonikidze and the Belgorod Power Machinery Plant for delays in delivering equipment for the third stage of the Beloyarskaya AES. As of 1 July, the Belgorod Power Machinery Plant had sent all the fittings required for the turbine. The Podol'sk Machine Building Plant is currently dispatching the second steam generator. The remaining equipment for the Beloyarskaya AES will be sent very soon by the plant. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA inRussian 29 Jul 79 p 2] 8480

FORGING ROBOT--The RM-15 mechanical hand makes the work of press operators significantly easier and safer. It is intended for rapid removal of forgings from the working part of the press. The design of this innovation, which is being demonstrated at the economic exhibition, allows simple and rapid readjustment, as well as regulation, of the working elements. [Text] [Moscow TRUD in Russian 10 Jul 79 p 2] 8480

PNEUMATIC ROBOTS--The Yaroslavl' "Mashpribor" plant has begun series production of pneumatic industrial robots. They are intended for automating loading and unloading of workpieces and parts during forging. The robots have a command apparatus and are simple to reprogram. Changing the cyclograms takes the operator only a few minures. Each such mechanism, working two shifts a day, will free up two persons and give an economic effect of up to 30,000 rubles a year. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 7 Aug 79 p 2] 8480

NEW MANIPULATOR DESIGN--The two hands of this manipulator [photo not reproduced] move with a precision within a tenth of a millimeter, relieving two persons of heavy labor. The robot inserts workpieces into presses and removes them, but it may also be used in other sections as a part of automated complexes or automated lines. When desired, individual subassemblies of the unit may be built into process equipment rather than installing the entire unit. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 19 Jul 79 p 4] 8480

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